Space Weather Forecast

Issued on Wednesday 30 October 2024 at 01:06 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated Moderate flares expected, with slight chance of Strong flares. S1 Minor Solar Radiation Storm easing.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate-class flare observed, however this occurred alongside a very long duration Common-class flare due to an eruption off the southwest disc. This was from a filament, also called a prominence when on the edge of solar disc, which is a line a material held together by the suns magnetic field, but can also be the source of eruptions. There are ten sunspot regions on the disc. The most likely flare source is the region in the northeast, as this has a clear mixed polarity trailer spot. Some decay was apparent in the south-centre disc spots however these continued to have a relatively complex appearance in SDO images. Development was observed in the spot to the northwest of these regions, with smaller spots emerging and coalescing into larger ones. This region also included a very small and weak mixed polarity spot. The other regions remains smaller or simpler.

No Earth-directed CMEs (coronal mass ejections) were observed. It is likely that the broad filament eruption associated with the Common class flare was directed south and west, ahead of and off the Earth-Sun line.

Solar Wind / Geomagnetic Activity: Ongoing fast winds from were observed. Solar wind speeds were slightly elevated between 450-500 km/s. Interplanetary Magnetic Field (IMF) was weak with its north-south component varying weakly but favouring a negative (southward) orientation from 29/1800 UTC. Resulting geomagnetic activity was Quiet (Kp2-3) with one Active interval (Kp4) 29/1800-2100 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) eased from S2 Moderate Solar Radiation Storm to be at the S1 Minor Radiation Storm level.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected, with isolated Moderate class flares. There is chance of rising to High with an isolated Strong flare.

Solar Wind / Geomagnetic Activity: There are no CME arrivals currently expected, with current fast winds expected to ease towards background day 1-2 (30-31 Oct). Mainly Quiet geomagnetic

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activity is expected, with isolated Unsettled intervals and a slight chance of Active intervals early on day 1 (30 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is expected to continue easing, likely falling below the S1 Minor Radiation Storm level in the next 24-48 hours. However, any further notable flares will bring the potential for further enhancement.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	75	75	75	75
Very Active	R3-R5 (X Class)	No	20	20	20	20

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	99	30	20	20
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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